

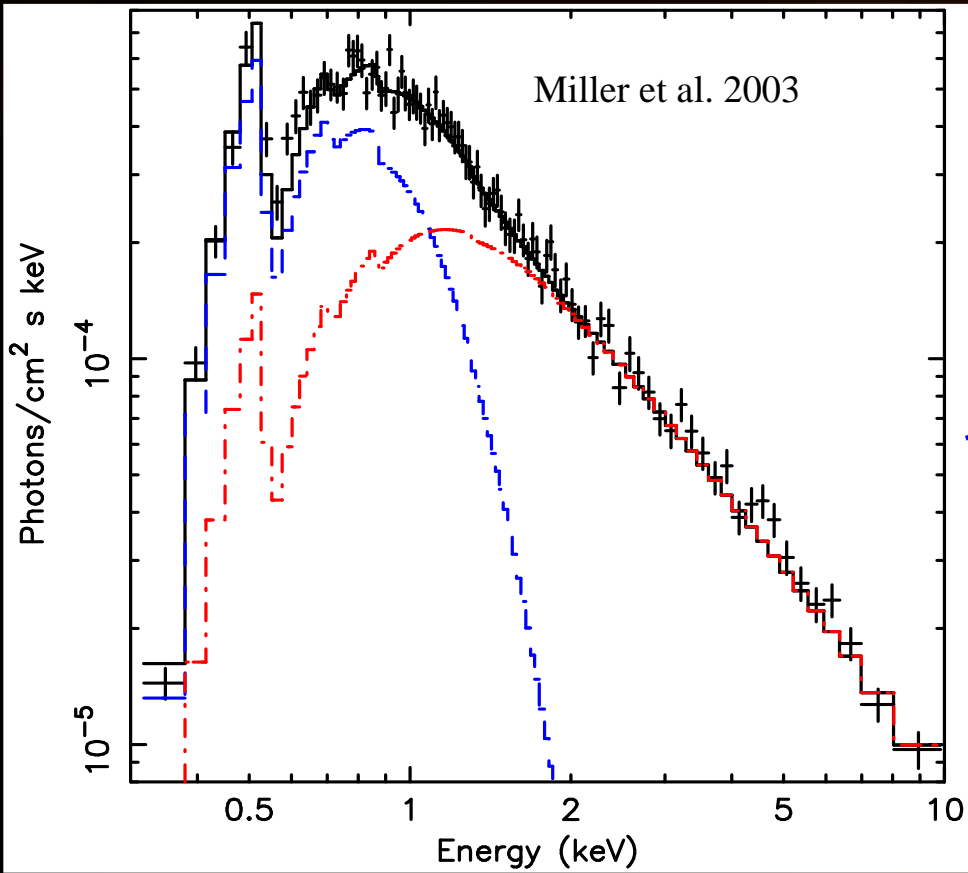


Revealing Intermediate Mass Black Holes in Nearby Normal Galaxies

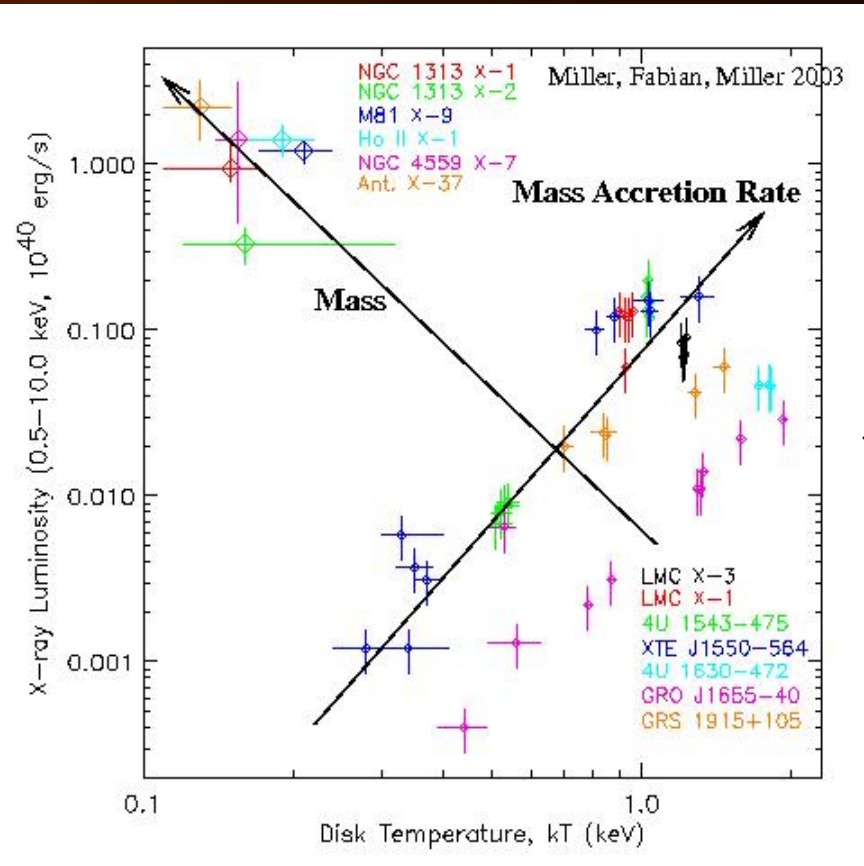
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Intermediate-mass black holes may have been formed by the first stars in the universe, and played a major role in early galaxy evolution and stellar cluster evolution. Observations of the most luminous point sources in nearby normal galaxies with Chandra and XMM-Newton have revealed evidence for intermediate-mass black holes. Constellation-X will make it possible to study these sources in the same detail with which Chandra and XMM-Newton presently study Galactic black holes. This poster demonstrates how a 1-day observation with Constellation-X can reveal the true nature of intermediate mass black hole candidates.

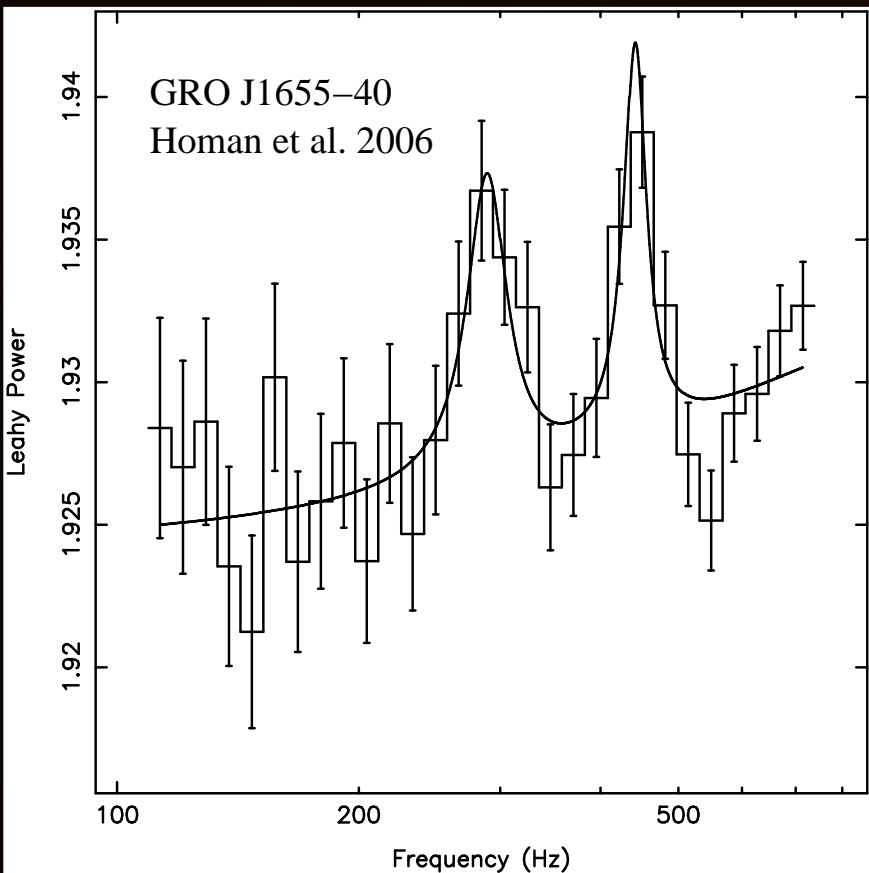
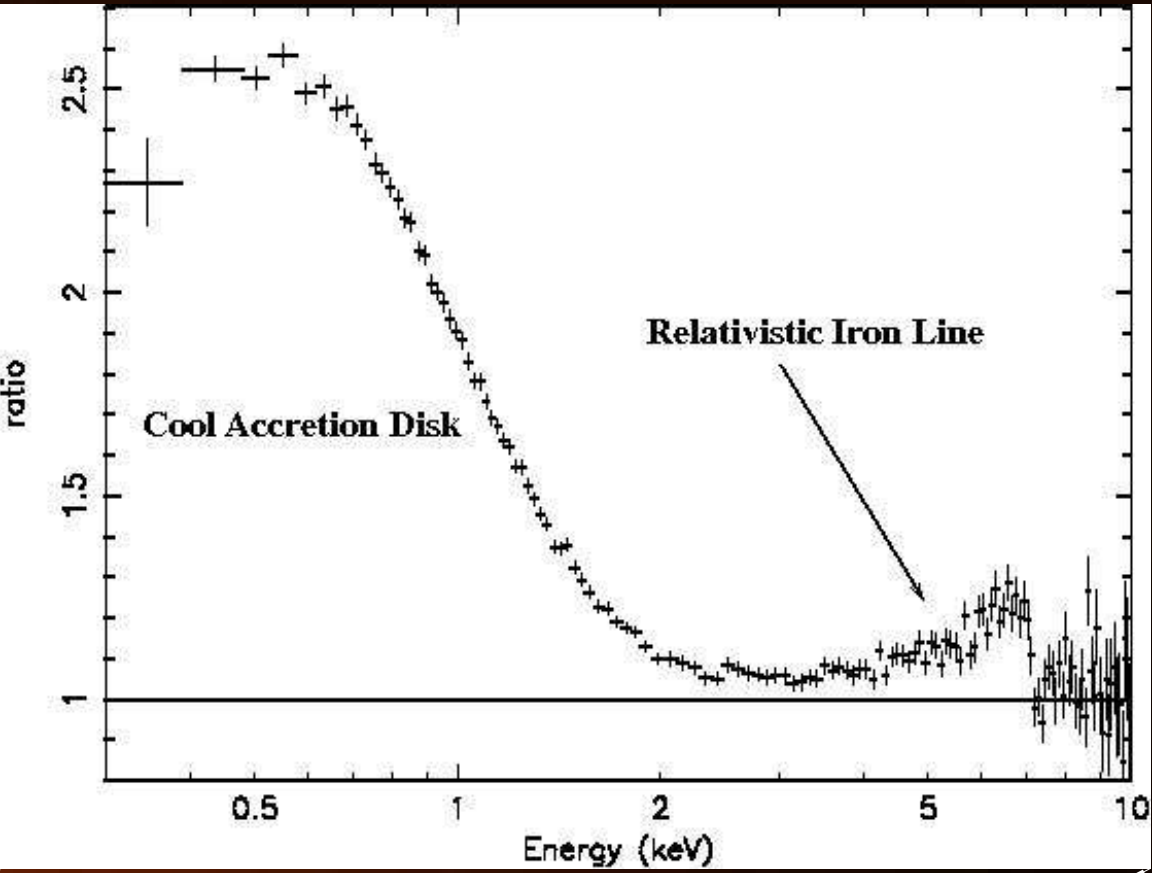
In a number of black hole point sources in nearby galaxies, Chandra and XMM-Newton have measured spectra with very cool accretion disk components.



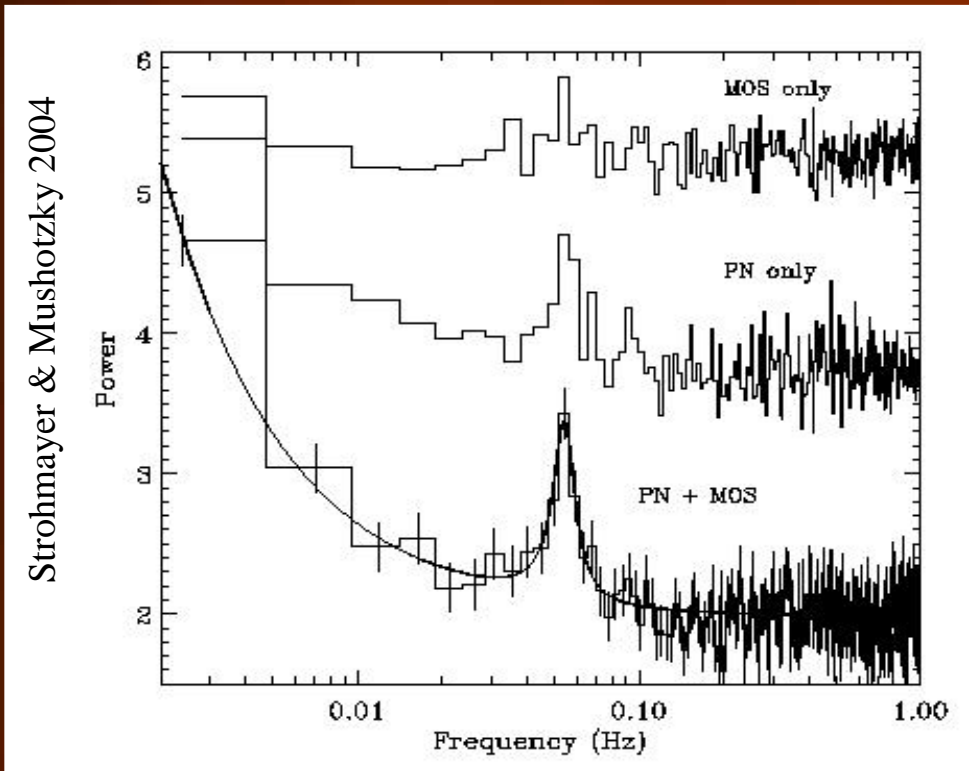
The temperature of an accretion disk around a black hole is inversely related to its mass. Carefully measuring disk temperatures can reveal intermediate mass black holes in nearby galaxies.



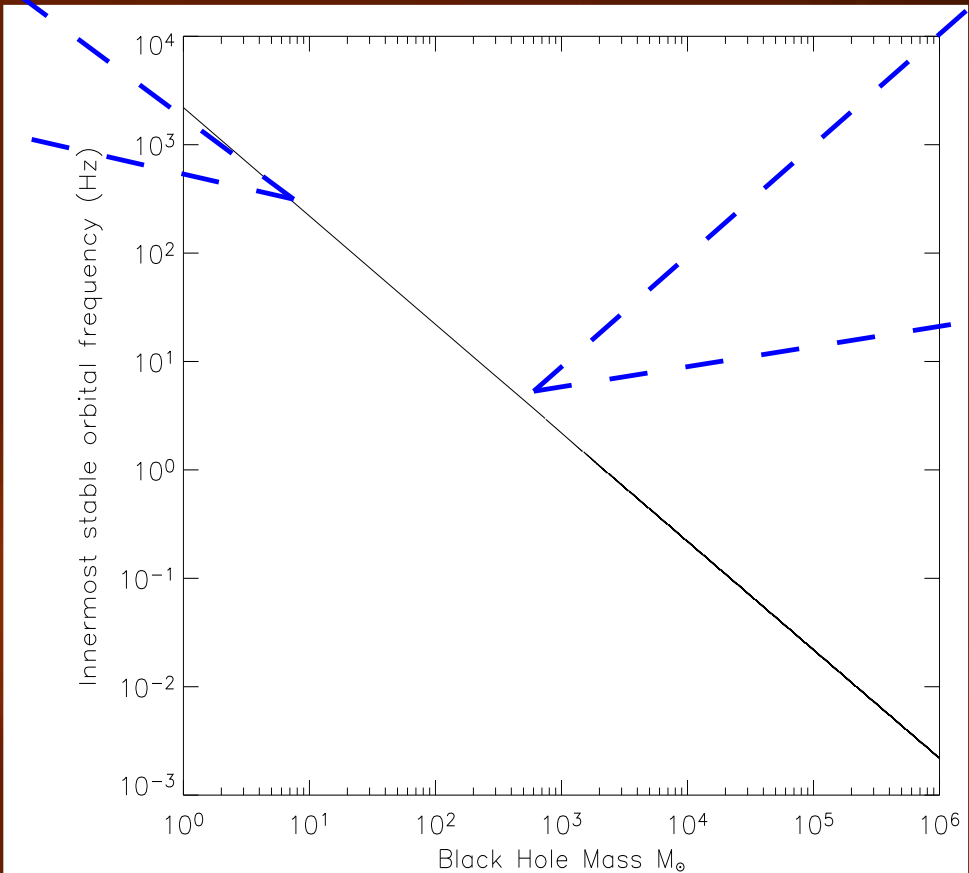
1-day observations of nearby galaxies with Constellation-X will provide sensitive spectra of numerous black hole sources. Not only will it be possible to measure the disk temperature, but relativistic iron lines will be revealed, which can be used to measure the spin of the black hole.



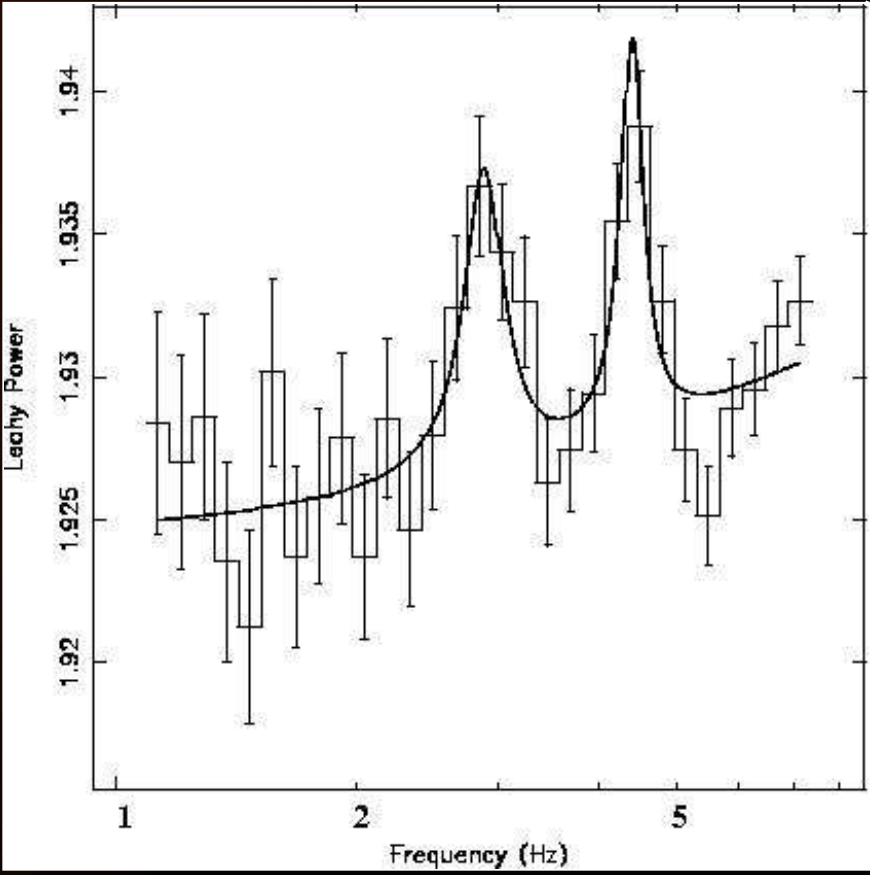
Quasi-periodic oscillations consistent with the innermost stable circular orbit around a 7 Msun Galactic black hole.



Observations of black hole point sources in nearby galaxies have revealed quasi-periodic oscillations.



The innermost stable circular orbit around a black hole is inversely related to black hole mass. Measuring characteristic frequencies from black holes can reveal the mass of the black hole itself.



1-day exposures of nearby galaxies with Con-X will detect the innermost frequencies from the black holes in those galaxies at the 7 sigma level, yielding crucial mass constraints.